WHAT IS CLAIMED IS:

1.   An access control system, comprising:

an object detector configured to detect persons present within a detection area;

a token reader configured to interrogate tokens present within a token reader area; and

an access controller configured to receive signals from the object detector and the token reader, and configured to compute one or more characteristics linking persons and tokens based upon signals received from the object detector and the token reader and to determine whether each detected person is carrying a permissioned token based upon the one or more computed characteristics linking persons and tokens.

2.   The system of claim 1, wherein the one or more computed characteristics linking persons and tokens correspond to counts of persons and tokens.

3.   The system of claim 2, wherein the access controller is configured to tally a count of persons based upon signals received from the object detector and to tally a count of tokens based upon signals received from the token reader.

4.   The system of claim 3, wherein the access controller is configured to generate a signal based upon a comparison of the persons count and the tokens count.

5.   The system of claim 4, wherein the access controller is configured to generate a signal when the persons count differs from the tokens count.

6.   The system of claim 4, wherein the access controller is configured to generate an access granted signal when the persons count is less than or equal to the tokens count.

7.   The system of claim 1, wherein the object detector is configured to track one or more persons within the detection area over time.

1   8.   The system of claim 7, wherein the object detector is a vision-based

2 person tracking system.

1   9.   The system of claim 8, wherein the object detector comprises a

2 video system configured to generate depth video streams from radiation received

3 from the detection area, and a processing system configured to detect and track

4 objects based at least in part upon data obtained from the depth video streams.

1   10.   The system of claim 9, wherein the object detector is operable to:

2   generate a three-dimensional point cloud having members with one or

3 more associated attributes obtained from the time series of video frames and

4 representing selected depth image pixels in a three-dimensional coordinate system

5 spanned by a ground plane and a vertical axis orthogonal to the ground plane;

6   partition the three-dimensional point cloud into a set of vertically-oriented

7 bins;

8   map the partitioned three-dimensional point cloud into at least one plan-

9 view image containing for each vertically-oriented bin a corresponding pixel

10 having one or more values computed based upon one or more attributes of the

11 three-dimensional point cloud members occupying the corresponding vertically-

12 oriented bin; and

13   track the object based at least in part upon the plan-view image.

1   11.   The system of claim 7, wherein movements of detected persons

2 within the detection area are time-stamped.

1   12.   The system of claim 1, wherein the token reader is configured to

2 wirelessly interrogate tokens within the token reader area.

1   13.   The system of claim 1, wherein the one or more computed

2 characteristics linking persons and tokens correspond to measures of separation

3 distance between persons and tokens.

1   14.   The system of claim 11, wherein the access controller is configured

2 to generate a signal when a detected person is separated from a nearest token by

3 a distance measure that exceeds a preselected threshold.

1   15.   An access control method, comprising:

2   detecting persons present within a detection area;

3   interrogating tokens present within a token reader area;

4   computing one or more characteristics linking persons and tokens based

5 upon results of the detecting and interrogating steps; and

6   determining whether each detected person is carrying a permissioned

7 token based upon the computed characteristics linking persons and tokens.

1   16.   The method of claim 15, wherein the one or more computed

2 characteristics linking persons and tokens correspond to counts of persons and

3 tokens.

1   17.   The method of claim 16, further comprising tallying a count of

2 persons, and tallying a count of tokens.

1   18.   The method of claim 17, further comprising generating a signal

2 based upon a comparison of the persons count and the tokens count.

1   19.   The method of claim 18, further comprising generating a signal

2 when the persons count differs from the tokens count.

1   20.   The method of claim 18, further comprising generating an access

2 granted signal when the persons count is less than or equal to the tokens count.

1   21.   The method of claim 15, further comprising tracking one or more

2 persons within the detection area over time.

1   22.   The method of claim 21, wherein tracking comprises generating

2 depth video streams from radiation received from the detection area, and

3 detecting and tracking objects based at least in part upon data obtained from the

4 depth video streams.

1   23.   The method of claim 22, wherein tracking comprises:

2   generating a three-dimensional point cloud having members with one or

3 more associated attributes obtained from the time series of video frames and

4 representing selected depth image pixels in a three-dimensional coordinate system

5 spanned by a ground plane and a vertical axis orthogonal to the ground plane;

6   partitioning the three-dimensional point cloud into a set of vertically-

7   oriented bins;

8   mapping the partitioned three-dimensional point cloud into at least one

9   plan-view image containing for each vertically-oriented bin a corresponding pixel

10 having one or more values computed based upon one or more attributes of the

11 three-dimensional point cloud members occupying the corresponding vertically-

12 oriented bin; and

13   tracking the object based at least in part upon the plan-view image.

1   24.   The method of claim 21, further comprising time-stamping

2   movements of detected persons within the detection area.

1   25.   The method of claim 15, wherein the token reader is configured to

2   wirelessly interrogate tokens within the token reader area.

1   26.   The method of claim 15, wherein the one or more computed

2   characteristics linking persons and tokens correspond to measures of separation

3   distance between persons and tokens.

1   27.   The method of claim 26, further comprising generating a signal

2   when a detected person is separated from a nearest token by a distance measure

3   that exceeds a preselected threshold.

1   28.   A machine-readable medium storing machine-readable instructions

2   for causing a machine to:

3   detect persons present within a detection area;

4   interrogate tokens present within a token reader area;

5   compute one or more characteristics linking persons and tokens based

6   upon results of the detecting and interrogating steps; and

7   determine whether each detected person is carrying a permissioned token

8   based upon the computed characteristics linking persons and tokens.

1   29.   The medium of claim 28, wherein the one or more computed

2   characteristics linking persons and tokens correspond to counts of persons and

3   tokens.

1   30.   The medium of claim 28, wherein the one or more computed
2   characteristics linking persons and tokens correspond to measures of separation
3   distance between persons and tokens.

1   31.   The medium of claim 28, further comprising tracking one or more
2   persons within the detection area over time.

1   32.   The medium of claim 30, wherein tracking comprises generating
2   depth video streams from radiation received from the detection area, and
3   detecting and tracking objects based at least in part upon data obtained from the
4   depth video streams.

1   33.   An access control method, comprising:
2   visually tracking a person;
3   determining whether the tracked person has a permissioned token based
4   on one or more characteristics linking persons and tokens; and
5   generating a signal in response to a determination that the tracked person
6   is free of any permissioned tokens.

1   34.   An access control method, comprising:
2   detecting tokens crossing a first boundary of a first area;
3   tallying a count of tokens in the first area based on the tokens detected
4   crossing the first boundary;
5   detecting persons crossing a second boundary of a second area;
6   tallying a count of persons in the second area based on the persons
7   detected crossing the second boundary; and
8   generating a signal in response to a determination that the persons count
9   exceeds the tokens count.

1   35.   The method of claim 34, wherein detecting tokens comprises
2   detecting tokens crossing the first boundary into and out of the first area.

1   36.   The method of claim 35, wherein tallying a count of tokens in the
2   first area comprises subtracting a count of persons crossing the first boundary out
3   of the first area from a count of persons crossing the first boundary into the first
4   area.

1   37.   The method of claim 34, wherein detecting persons comprises
2   detecting persons crossing the second boundary into and out of the second area.

1   38.   The method of claim 37, wherein tallying a count of persons in the
2   second area comprises subtracting a count of persons crossing the second
3   boundary out of the second area from a count of persons crossing the second
4   boundary into the second area.

1   39.   An access control system, comprising:
2   a token reader configured to detect tokens crossing a first boundary of a
3   first area;
4   an object detector configured to detect persons crossing a second boundary
5   of a second area; and
6   an access controller configured to tally a count of tokens in the first area
7   based on the tokens detected crossing the first boundary, tally a count of persons
8   in the second area based on the persons detected crossing the second boundary,
9   and generating a signal in response to a determination that the persons count
10 exceeds the tokens count.

1   40.   A machine-readable medium storing machine-readable instructions
2   for causing a machine to:
3   detect tokens crossing a first boundary of a first area;
4   tally a count of tokens in the first area based on the tokens detected
5   crossing the first boundary;
6   detect persons crossing a second boundary of a second area;
7   tally a count of persons in the second area based on the persons detected
8   crossing the second boundary; and
9   generate a signal in response to a determination that the persons count
10 exceeds the tokens count.